



## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P045210PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/NL 03/00477	International filing date (day/month/year) 27.06.2003	Priority date (day/month/year) 27.06.2002
International Patent Classification (IPC) or both national classification and IPC B28B7/30		
Applicant CONNECTOR VINKEVEEN B.V.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 10 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input checked="" type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(II) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand  23.01.2004	Date of completion of this report  26.10.2004	
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5816 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tlx 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Orj, J  Telephone No. +31 70 340-4563 	

INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

International application No. PCT/NL 03/00477

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

2-10 as originally filed  
1, 1a received on 16.08.2004 with letter of 16.08.2004

Claims, Numbers

1-20 received on 16.08.2004 with letter of 16.08.2004

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 28.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☒ the claims, Nos.: 21,22  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**International application No. **PCT/NL 03/00477**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.  
☐ paid additional fees.  
☐ paid additional fees under protest.  
☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.  
☒ not complied with for the following reasons:

see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.  
☒ the parts relating to claims Nos. 1-13, 19, 20.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Yes: Claims	1-13, 19
	No: Claims	20
Inventive step (IS)	Yes: Claims	
	No: Claims	1-13, 19, 20
Industrial applicability (IA)	Yes: Claims	1-13, 19, 20
	No: Claims	

**2. Citations and explanations**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/NL 03/00477**

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see separate sheet

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NL 03/00477

**Re Item IV**

**Lack of unity of invention**

1. The separate groups of invention are:  
I: claims 1-13,19,20  
Method for securing a metal part in a concrete part  
II: claims 14-18  
Method for casting a hoisting feature
2. The two different groups of inventions are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:
  - 2.1 The prior art has been identified as BE-A-502 991 (D1). This document discloses a method for securing a metal part in a concrete part (pag. 4, l. 6-20; fig. 13,14), comprising the steps of providing a concrete part having a cavity which extends from an outer wall thereof (fig. 13), of providing a formwork (pag. 3, l. 51-55; fig. 13), of placing a body (1) into said formwork, the shape of which body at least partially corresponds to said cavity and that side of which body that adjoins the concrete material comprising an elastomer material, the mechanical properties of said body being such that, when tensile force is applied to said body in the vicinity of said boundary surface, the diameter of said body is considerably reduced (pag. 1, l. 8-21), with the result that said body, after the concrete has been poured and at least partially set, can be removed from said shaped cavity, which diameter of said body can be elastically reduced, of pouring and at least partially setting the concrete, detaching said formwork and said body (pag. 3, l. 51 - pag. 4, l. 6) and securing said metal part in said cavity (pag. 4, l. 6-20).
  - 2.2 From the comparison of the first invention and the disclosure of D1, the following technical feature of the first invention (claims 1-13,19,20) can be seen to make a contribution over D1 and therefore is considered to be the special technical feature (Rule 13.2 PCT) of the first invention:
    - said securing step comprises the step of filling the space between the concrete part and said metal part with a material which bonds to said metal part and to said concrete part.

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INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET

International application No. PCT/NL 03/00477

The objective technical problem which will be solved by this special technical feature can be seen as how to connect in the cavity of the concrete part a metal part.

2.3 D1 discloses a method for producing a cavity in a concrete part, which cavity is elongate and, at least at one end, opens out at a boundary surface of said concrete part, comprising the steps of placing a body, the shape of which at least partially corresponds to said cavity, into a formwork, filling said formwork with a concrete material and, after the concrete material has set, removing said body, wherein the body adjoining the concrete material comprises an elastomer material (cf. pag. 3, l. 51 - pag. 4, l. 20).

2.4 From the comparison of the second invention and the disclosure of D1, the following technical feature of the second invention (claims 14-18) can be seen to make a contribution over D1 and therefore is considered to be the special technical feature (Rule 13.2 PCT) of the second invention:

- the cavity opens out at both ends at the same boundary surface of said concrete part, and in which a reinforcement is provided, around which concrete material which is to be set is poured into a mould, which reinforcement is arranged in such a manner that it extends on both sides of said body, and said cavity is embodied to receive a hoisting feature.

The objective technical problem which will be solved by this special technical feature can be seen as to remove the concrete part after casting.

2.5 The above analysis shows that the special technical features of the different groups of inventions are not the same. A comparison of the objective problems related to the different groups of inventions, all seen in the light of the description and the drawings of the application, shows that they are all different and have no corresponding technical effect.

Consequently the special technical features of the different inventions do not correspond and the requirements of Unity of Invention (Rule 13.2 PCT) are not fulfilled.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NL 03/00477

**Re Item V****Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1 Reference is made to the following documents:**

- D1: BE-A-502 991 (S.T.U.P.) 31 May 1951 (1951-05-31)
- D2: DE-C-43 24 522 (KRAUSS PETER) 5 January 1995 (1995-01-05)
- D3: GB-A-151 692 (JOHN WOOLCOCK; WILLIAM JOHN STEWART) 20 September 1920 (1920-09-20)
- D4: US-A-4 084 780 (MESS RICHARD C) 18 April 1978 (1978-04-18)
- D5: DATABASE WPI Section Ch, Week 199249 Derwent Publications Ltd., London, GB; Class A26, AN 1992-402173 XP002257565 - & JP 04 298302 A (JAPAN SYNTHETIC RUBBER CO LTD), 22 October 1992 (1992-10-22)

**2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim independent 1, and discloses (the references in parentheses applying to this document):**

Method for securing a metal part in a concrete part (pag. 4, l. 6-20; fig. 13,14), comprising the steps of providing a concrete part having a cavity which extends from an outer wall thereof (fig. 13), of providing a formwork (pag. 3, l. 51-55; fig. 13), of placing a body (1) into said formwork, the shape of which body at least partially corresponds to said cavity and that side of which body that adjoins the concrete material comprising an elastomer material, the mechanical properties of said body being such that, when tensile force is applied to said body in the vicinity of said boundary surface, the diameter of said body is considerably reduced (pag. 1, l. 8-21), with the result that said body, after the concrete has been poured and at least partially set, can be removed from said shaped cavity, which diameter of said body can be elastically reduced, of pouring and at least partially setting the concrete, detaching said formwork and said body (pag. 3, l. 51 - pag. 4, l. 6) and securing said metal part in said cavity (pag. 4, l. 6-20).

from which the subject-matter of claim 1 differs in that said securing step comprises the step of filling the space between the concrete part and said metal part with a material which bonds to said metal part and to said concrete part.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

## INTERNATIONAL PRELIMINARY

International application No. PCT/NL 03/00477

EXAMINATION REPORT - SEPARATE SHEET

- 3.2 The problem to solved by the present invention may be regarded as how to secure a metal part in a concrete part.

The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT), because securing a metal part to the inside of a cavity of a concrete part by filling the space between them with a bonding material is described in document D2 (col. 3, l. 40-44; fig. 3) as providing the same advantages as in the present application. The skilled person would therefore regard it as a normal option to include this feature in the elastomer plug as described in document D1 in order to solve the problem posed. The subject-matter of claim 1 is therefore not inventive (Article 33(3) PCT).

- 3.3 The document D2 is regarded as being the closest prior art to the subject-matter of independent claim 20 (see also section VII, paragraph 2.), and discloses (the references in parentheses applying to this document):

Assembly comprising two concrete parts secured to one another (cf. fig. 5), comprising a concrete part and a further concrete part, said concrete part comprising, at the boundary surface with said further concrete part a series of cavities which extend substantially perpendicular to said boundary surface, the boundary wall of said cavities comprises concrete, said further concrete part being provided, at the boundary surface with the concrete part, with a series of projecting reinforcing bars which, in the coupled state to said concrete part, extend into the cavities in said concrete part, the space between said cavity and said reinforcing bars being filled with a material which bonds said reinforcing bars to said concrete body.

Therefore claim 20 is deprived from novelty in the sense of Article 33(2) PCT.

- 3.4 Dependent claims 2-13 and 19 do not seem to contain additional features which, in combination with the features of claim 1 meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

- the body which at least partially corresponds to the cavity to be formed and externally provided with a profiling according to claim 2 is known from D1 (fig. 3, 8, 9, 16);
- the step according to claims 3 and 4, in which the metal part is secured by screwing the metal part into a encased threaded part present in the cavity is known from D4 which document discloses in combination with D2 also all the

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NL 03/00477

- features of claim 1 (col. 4, l. 58-66; fig. 1);
- securing a series of metal parts in a concrete part, wherein the bodies are connected by a common carrier, i.e. the inner side of the form work, according to claim 5-7 and 13, is also known from D4 (col. 6, l. 7-33; fig. 7);
- carrying out the casting method in a factory is a very well known method to a man, whether or not skilled in the art, of making PRE-fabricated concrete articles, claim 8 can therefore not be considered as involving an inventive step;
- the metal part comprising steel according to claim 9, is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed and can therefore not be considered as involving an inventive step;
- the metal part being arranged in a further part, according to claim 10 is known from D1 (pag. 3, l. 51 - pag. 4, l. 12; fig. 14);
- the elastomer body comprising a polysiloxane is known from D5 and is for the person skilled in the art an equivalent to the rubber core (pag. 2, l. 65-74) of D1 and can be interchanged with that feature where circumstances make it desirable.
- the body comprising a core made of a material with a higher tensile strength than the wall of the body according to claim 12, is known from D1 (pag. 3, l. 31-40; fig. 5-10).
- the body comprising a core with a non-fixed elastomer around it, as claimed in claim 19, is merely one of several straightforward possibilities from which the skilled person would select, in order to ease the withdrawal of the core. This technique is already applied since 1920 (cf. D3, pag. 3, l. 86-118; fig. 2).

**Re Item VII**

**Certain defects in the international application**

1. Claim 6 comprises the steps of providing a formwork, placing a series of bodies into said formwork, the exterior of each of said bodies comprising an elastomer material, introducing said metal part in said cavity and securing said metal part in said cavity. In order to obtain a concrete part, concrete has to be poured and before the metal part can be introduced the series of bodies have to be detached. Since it is obvious that an error has been made, the claim is interpreted as follows:
  - "... comprising the steps of providing a formwork, placing a series of bodies into said formwork, the exterior of each of said bodies comprising an

## INTERNATIONAL PRELIMINARY

International application No. PCT/NL 03/00477

EXAMINATION REPORT - SEPARATE SHEET

elastomer material, of pouring and at least partially setting concrete, detaching said formwork and said bodies and introducing said metal part in said cavity and securing said metal part in said cavity."

2. The features "comprising a concrete part ... which bonds said reinforcing bars to said concrete body." of claim 20 relate to how an assembly of two concrete parts is made rather than clearly defining the entity in term of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.
3. Independent claim 20 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (D1) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
4. The features of the claims 1-12 and 19,20 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

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The present invention relates to method for arranging a cavity in a concrete part. A method of this type is known from Belgium patent 502991. This patent describes the production of a cavity by the introduction of an elastomeric material into a formwork. This rubber elastomeric material extends through the boundary wall of the formwork. —

5 At the location where it passes through the formwork, the rubber elastomeric material forms an acute angle, so that a larger cavity is formed as a result of the formwork wall being provided with a number of auxiliary parts at that location. After the concrete has been poured, the rubber elastomeric material is removed and a stay or cable is arranged in the cavity formed in this way and tensioned by coupling parts which act on it from

10 the outside.

GB 682320 discloses a method for providing an elongated cavity in a concrete article for receiving reinforcement elements such as a number of wires, which might be highly tensioned to form a pre-stressed beam or girder.

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It is an object of the present invention to make it easier to couple concrete parts and other parts to one another. In the prior art, concrete parts are coupled to one another by a concrete part being provided with projecting (threadable) reinforcing bars (dowels and plug-connection anchors) and the other concrete part is provided with cavities

20 which match them. After they have been put together, the space between the concrete bars and the cavities in the concrete part are poured full of concrete. These cavities are produced by fitting pipes into the formwork before the concrete is poured. After the concrete has been poured out, these pipes remain behind in the formwork. This firstly entails considerable costs, since the pipes have to be considered lost, meaning

25 considerable outlay. Secondly, bonding takes place between the concrete and the pipes and between the pipes and the reinforcing bar.

The object of the present invention is to provide a method of this type which enables a concrete part to be secured to the surroundings.

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According to one aspect of the present invention, this object is realised in a method for securing a metal part in a concrete part, comprising the steps of providing a concrete part having a cavity which extends from an outer wall thereof, of providing a

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formwork, of placing a body into said formwork, the shape of which body at least partially corresponds to said cavity and that side of which body that adjoins the

Printed: 21-10-2004

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## Claims

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1. Method for securing a metal part in a concrete part, comprising the steps of providing a concrete part having a cavity which extends from an outer wall thereof, of providing a formwork, of placing a body into said formwork, the shape of which body at least partially corresponds to said cavity and that side of which body that adjoins the concrete material comprising an elastomer material, the mechanical properties of said body being such that, when tensile force is applied to said body in the vicinity of said boundary surface, the diameter of said body is considerably reduced, with the result that said body, after the concrete has been poured and at least partially set, can be removed from said shaped cavity, which diameter of said body can be elastically reduced, of pouring and at least partially setting the concrete, detaching said formwork and said body and securing said metal part in said cavity, characterized in that said securing step comprises the step of filling the space between the concrete part and said metal part with a material which bonds to said metal part and to said concrete part,
2. Method as claimed in claim 1, in which said body is externally provided with a profiling.
3. Method as claimed in one of the preceding claims, in which said securing step comprises the step of screwing said metal part into a screw thread arranged in said cavity.
4. Method as claimed in claim 3, in which said screw thread comprises an encased threaded part.
5. Method of securing a series of metal parts in a concrete part, comprising the steps of providing a concrete part having arranged therein a series of cavities, which extend as far as an outer wall of a concrete part, in said concrete part, comprising the steps of providing a formwork, placing a series of bodies into said formwork, the exterior of each of said bodies comprising an elastomer material, introducing said metal parts in said cavity and securing said metal part in said cavity.

Printed: 21-10-2004

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NL0300477

2

6. Method as claimed in claim 5, in which said series of bodies are connected by a common carrier.
7. Method as claimed in one of the preceding claims, in which said body is secured to the inner side of the formwork adjoining the latter, and after said formwork has been removed said body is also taken away.
8. Method as claimed in one of the preceding claims, in which said concrete part is poured in a factory remote from its final destination.
9. Method as claimed in one of the preceding claims, in which said metal part comprises reinforcing steel.
10. Method as claimed in one of the preceding claims 1-4, in which said metal part is arranged in a further concrete part.
11. Method as claimed in one of the preceding claims, in which said elastomer body comprises a polysiloxane material.
12. Method as claimed in one of the preceding claims, in which said body comprises a core made from a material with a higher tensile strength than its wall, is provided with a supporting surface and is self-supporting.
13. Method as claimed in one of the preceding claims, in which said body is provided, in the vicinity of the formwork end, with securing means (99, 109) for securing it to said formwork.
14. Method for producing a cavity in a concrete part, which cavity is elongate and, at least at one end, opens out at a boundary surface of said concrete part, comprising the steps of placing a body, the shape of which at least partially corresponds to said cavity, into a formwork, filling said formwork with concrete material and, after this concrete material has set, removing said body, characterized in that that side of said body which

Printed: 21-10-2004

CLMSPAMD

NL0300477

3

adjoins the concrete material to be poured comprises an elastomer material.

15. Method as claimed in claim 14, in which said cavity opens out at both ends at the same boundary surface of said concrete part, and in which a reinforcement is provided, around which concrete material which is to be set is poured into a mould, which reinforcement is arranged in such a manner that it extends on both sides of said body, and said cavity is embodied to receive a hoisting feature.

16. Method as claimed in claim 14 or 15, in which said body is provided with series of projections which, when fitted into said formwork, extend at a distance from said end.

17. Method as claimed in claim 16, in which said projections comprise an external screw thread.

18. Method as claimed in one of claims 14-17, in which said body is provided with a receiving means for a part which is to be encased, and after the concrete body has set, said part which is to be encased remains behind in the set concrete when said body is removed.

19. Method as claimed in one of the preceding claims, in which said body comprises a core with an elastomer coating arranged around it, and in which the removal of said body from said concrete comprises firstly the removal of the core, followed by the elastomer material.

20. Assembly comprising two concrete parts secured to one another, comprising a concrete part and a further concrete part, said concrete part comprising, at the boundary surface with said further concrete part a series of cavities which extend substantially perpendicular to said boundary surface, the boundary wall of said cavities comprises concrete, said further concrete part being provided, at the boundary surface with the concrete part, with a series of projecting reinforcing bars which, in the coupled state to said concrete part, extend into the cavities in said concrete part, the

Printed: 21-10-2004

CLMSPAMD

NL0300477

4

space between said cavity and said reinforcing bars being filled with a material which bonds said reinforcing bars to said concrete body.

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